

CLAIMS

What is claimed is:

- 1 1. A transmitter for use in a communication system
2 comprising:
3 a signal folder for rearranging a signal wherein a plurality
4 of complex time samples are modulated on an in-phase carrier;
5 and
6 an envelope shaper for shaping the envelope of the signal.
- 1 2. A receiver for use in a communication system comprising:
2 a signal unfolder for reconstructing a signal comprising a
3 plurality of complex time samples modulated on an in-phase
4 carrier.
- 1 3. A communication system comprising:
2 a transmitter wherein a first signal is rearranged such that
3 a plurality of complex time samples are modulated on an in-
4 phase carrier and an envelope of the signal is shaped to create a
5 second signal; and
6 a receiver in communication with the transmitter through a
7 noisy channel for receiving said second signal comprising a
8 plurality of complex time samples modulated on an in-phase
9 carrier, wherein the receiver reconstructs said first signal from
10 the envelope shaped second signal.
- 1 4. A method for shaping an envelope a complex signal,
2 composed of a plurality of sample symbols with a real part and
3 imaginary part, by keeping the amplitude of each of said sample
4 symbols at or below a threshold value, said method comprising
5 the steps of:
6 rearranging a first signal in time domain;

obtaining the amplitude of one of said sample symbols of said first signal;

comparing the amplitude of said one of said sample symbols to said threshold value;

the amplitude and sign of real part of each of a second set of a plurality of sample symbols to the amplitude and sign of the real part of said one of said sample symbols, if the amplitude of the real part of said one of said sample symbol is equal to or less than said threshold value;

setting the imaginary part of each of a second set of a plurality of sample symbols to the amplitude value equal to said threshold value minus the amplitude of the real part said one said sample symbols and wherein the sign of the imaginary part of each of a second set of a plurality of sample symbols is the sign of the real part of said one of said sample values, if the amplitude of the real part of said one of said sample symbol is equal to or less than said threshold value;

setting the sign of the real part of each of a second set of a plurality of sample symbols to positive and the amplitude of real part of each of a second set of a plurality of sample symbols to half the amplitude of the real part of said one of said sample symbols, if the amplitude of the real part of said one of said sample symbol is greater than said threshold value; and

setting the sign of the imaginary part of each of a second set of a plurality of sample symbols to negative and the amplitude value of the imaginary part of each of a second set of a plurality of sample symbols equal to one half the amplitude of the real part said one said sample symbols, if the amplitude of the real part of said one of said sample symbol is greater than said threshold value.

5. The method of claim 4 wherein the steps of the method are repeated for each of said plurality of sample symbols.

6. A method for shaping an envelope a complex signal, composed of a plurality of sample symbols with a real part and imaginary part, by keeping the amplitude of each of said sample symbols at or below a threshold value, said method comprising the steps of:

rearranging a first signal in time domain;

obtaining the amplitude of one of said sample symbols of said first signal;

comparing the amplitude of said one of said sample symbols to said threshold value;

the amplitude and sign of real part of each of a second set of a plurality of sample symbols to the amplitude and sign of the real part of said one of said sample symbols, if the amplitude of the real part of said one of said sample symbol is equal to or less than said threshold value;

setting the amplitude of the imaginary part of each of a second set of a plurality of sample symbols to the square root of (the square of said threshold value minus the square of the amplitude of the real part of said one of said sample symbols) and wherein the sign of the imaginary part of each of a second set of a plurality of sample symbols is the sign of the real part of said one of said sample values, if the amplitude of the real part of said one of said sample symbol is equal to of less than said threshold value;

setting the sign of the real part of each of a second set of a plurality of sample symbols to positive and the amplitude of real part of each of a second set of a plurality of sample symbols to

28 half the amplitude and of amplitude of the real part of said one of
 29 said sample symbols, if the amplitude of the real part said one of
 30 said sample symbol is greater than said threshold value; and

31 setting the sign of the imaginary part of each of a second
 32 set of a plurality of sample symbols to negative and the
 33 amplitude value of the imaginary part of each of a second set of
 34 a plurality of sample symbols equal to one half the amplitude of
 35 the real part said one said sample symbols, if the amplitude of
 36 the real part said one of said sample symbol is greater than said
 37 threshold value.

- 1 7. The method of claim 6 wherein the steps of the method are
- 2 repeated for each of said plurality of sample symbols.